National Park Service
U.S. Department of the Interior

Lake Clark National Park and Preserve

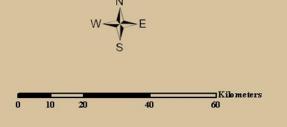


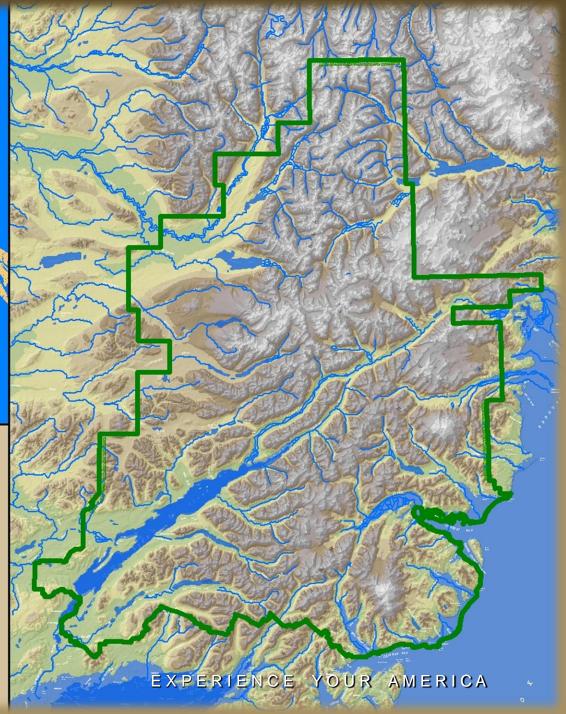
Evaluating survival and home range use of Dall's sheep in Lake Clark National Park and Preserve, Alaska

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Lake Clark National Park and Preserve





Lake Clark National Park and Preserve (LACL) was established in 1950 by the Alaska National Interest Lands Conservation Act (ANILCA) to among other things "protect habitat for and gopulations of fish and wildlife including, but not limited to, caribou, Dall sheep, brown/grizzly bears, bald eagle and peregrine ANILCAFalsonmandatesithatOthé?Nés) conserve "natural and healthy populations of fish and wildlife" (Section 815).

Dall's Sheep Populations in LACL

- Two complete surveys since LACL was formally designated in 1980.
- Seven surveys of the southern park and preserve where human use is greatest.
- Southern population has varied from a high of 302
 sheep to a low of 144 sheep during the 7 surveys.

Objectives

- Determine survival rates for Dall's sheep in LACL
- Determine timing and spatial distribution of mortalities
- Identify range use patterns of Dall's sheep in LACL
- Assess range use differences among subpopulations of Dall's sheep.









Capture Data

- Forty sheep were captured during 3 capture events between 2005 and 2007.
- Captured sheep consisted of 26 ewes and 14 rams.
- Average age of ewes and rams captured was 6.4 and 5.6 years, respectively.
- All were fitted with GPS radio-collars set to obtain locations every 5 or 7 hours.
- Collars contained programmable remote release mechanisms.
- Handling time averaged 22 minutes (range: 9-43 minutes).



Collar Recovery



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Methods

- Annual Survival was calculated using the Kaplan-Meier method modified for staggered entry.
- Home range was determined using 2 estimators:
 Minimum Convex Polygon and Fixed Kernel Analysis
 for all sheep surviving ≥ 6 months.
- Fixed kernel analysis included both 95% and 50% contours to represent home range and core use areas, respectively.

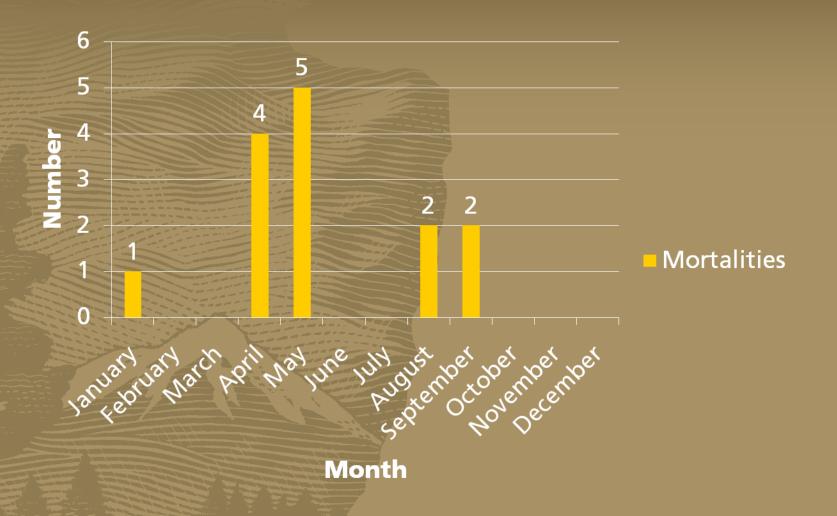


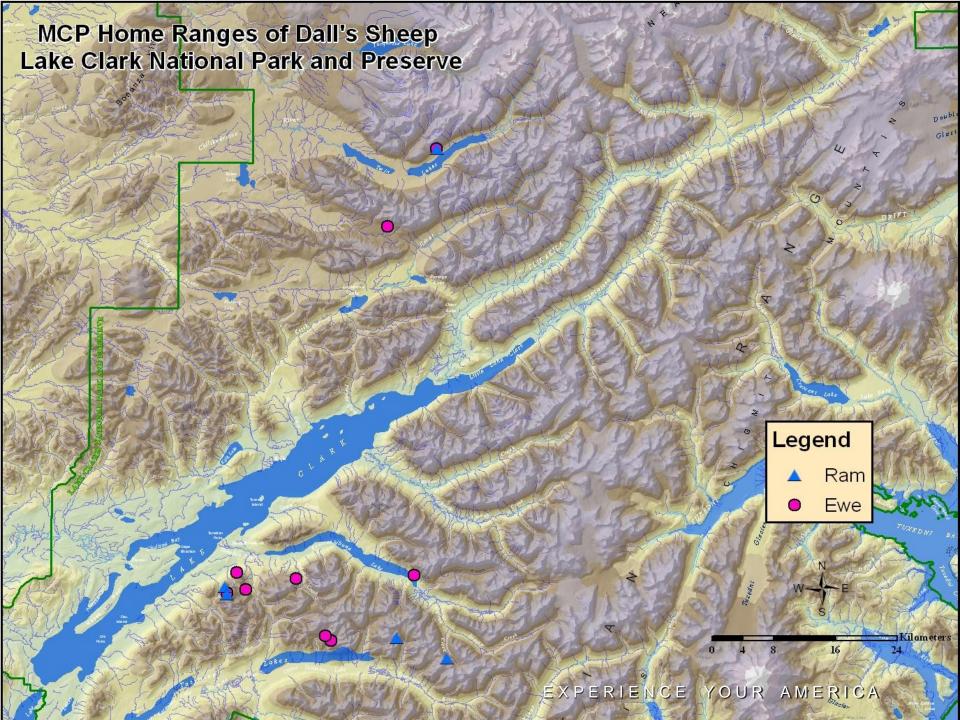
Survival Rates

Sex	2005-2006	2006-2007
Female	0.77 <u>+</u> 0.09 (<i>n</i> =22)	0.85 <u>+</u> 0.08 (<i>n</i> =20)
Male	0.75 <u>+</u> 0.13 (<i>n</i> =12)	0.82 <u>+</u> 0.12 (<i>n</i> =11)

Survival was not significantly different between years or sexes.

Mortalities by Month



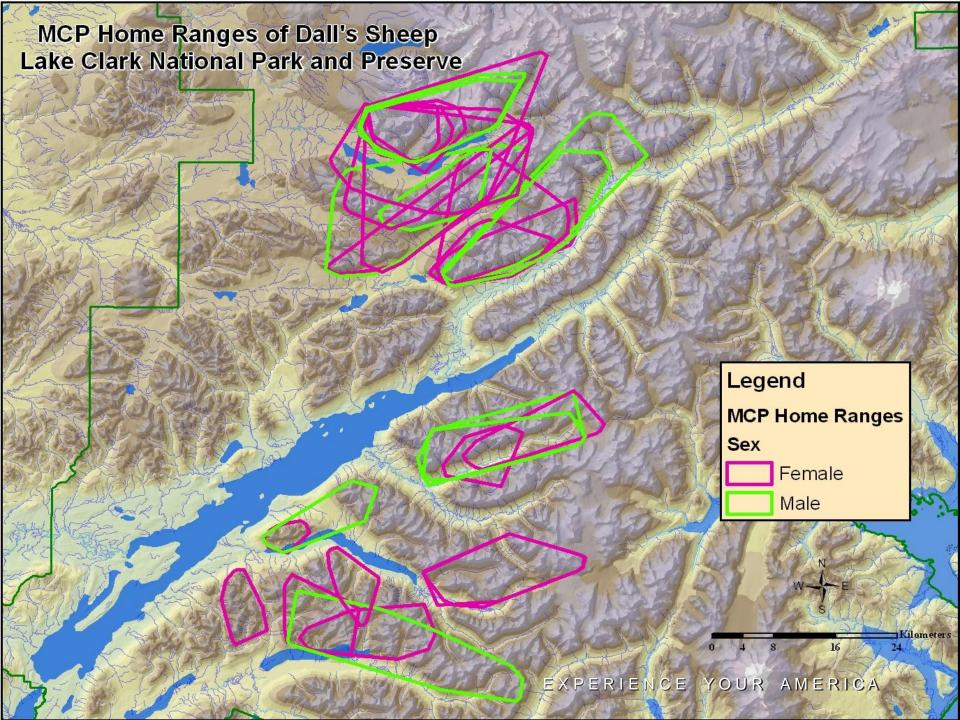




Home Range Sizes MCP

Sex/Region	South (km²)	Central (km²)
Female	71.0 <u>†</u> 26.2 (<i>n</i> =9)	166.5 <u>†</u> 24.9 (<i>n</i> =10)
Male	134.9 <u>†</u> 39.3 (<i>n=4</i>)	170.8 <u>†</u> 32.1 (<i>n</i> =6)

MCP home range size between regions was significantly different (p=0.045)
MCP home range size between sexes was not significantly different (p=0.28)



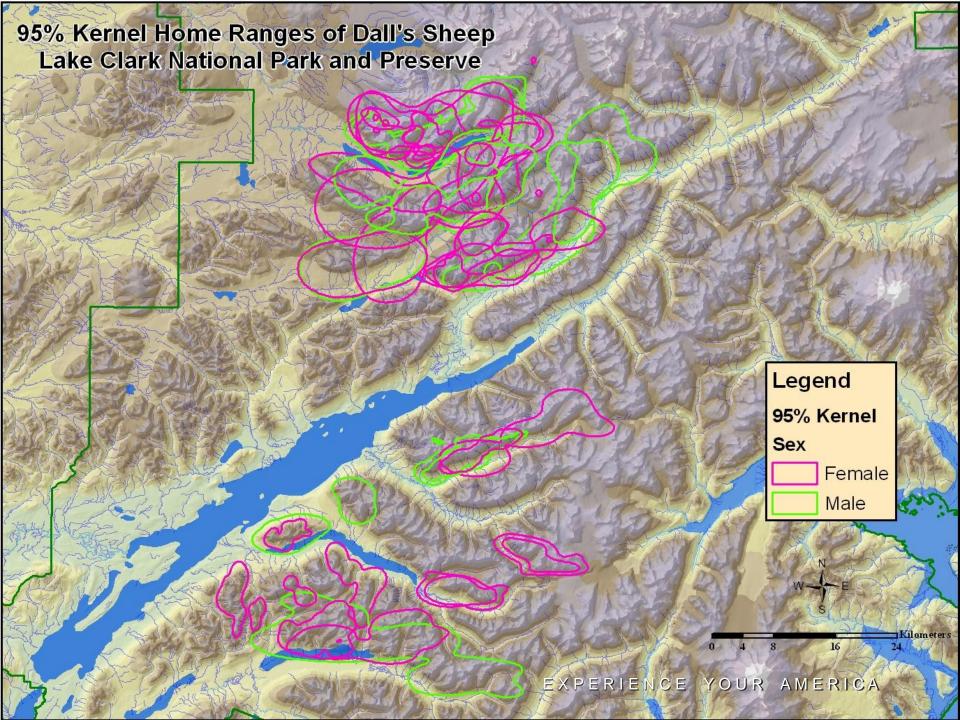
Home Range Sizes Fixed Kernel

Sex/Region	South (km²)	Central (km²)
Female	53.7 <u>†</u> 27.5 (<i>n</i> =9)	138.3 <u>†</u> 26.1 (<i>n</i> =10)
Male	88.6 <u>†</u> 41.2 (<i>n</i> =4)	157.4 <u>†</u> 33.7 (<i>n</i> =6)

Kernel home range size between regions was significantly different (p=0.014)

Kernel home range size between sexes was not significantly different (p=0.194)

Kernel home range size of females was significantly different between regions (p=0.038



Core Area Size Fixed Kernel

Sex/Region	South (km²)	Central (km²)
Female	9.2 <u>†</u> 4.1 (<i>n</i> =9)	17.1 <u>†</u> 3.9 (<i>n</i> =10)
Male	15.0 <u>†</u> 6.2 (<i>n</i> =4)	32.0 <u>†</u> 5.0 (<i>n</i> =6)

Kernel core area size between regions was significantly different (p=0.017) Kernel core area size between sexes was significantly different (p=0.044)

